

AN ENVIRONMENTAL INVENTORY OF THE ARMAND BAYOU COASTAL PRESERVE

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EXECUTIVE SUMMARY

The goal of this report was to gather and integrate existing data, identify data gaps, and describe the environmental attributes of Armand Bayou relevant to the development of a management plan for the Armand Bayou Coastal Preserve. Armand Bayou can be influenced by events anywhere within, as well as beyond, its watershed.

The physical characteristics of the coastal preserve area have changed drastically due to 5 to 9 feet of land-surface subsidence across the watershed since 1906. The lower reach of the bayou has changed from a wetland-bordered freshwater stream to a brackish tidal lake nearly devoid of wetlands. Mud Lake has expanded from 100 acres in 1956 to more than 325 acres today. All of the 275 acres of wetlands present in 1956 have been lost; replacement wetlands, of a different nature, amount to 24 acres, for a net loss of 91 percent.

The water quality of Armand Bayou is poor. It is ranked as the second-highest stream on the Texas coast for hypoxia, a condition of low oxygen produced by algae responding to elevated nutrient levels. Annual and monthly levels for total and ortho-phosphorus are persistently above thresholds characteristic of eutrophic streams. Ammonia and nitrate nitrogen exceed eutrophic thresholds during the cooler months but appear to be removed from the bayou by accelerated algal growth during warm months. Fecal coliforms are a problem of long standing. No investigation of toxicants in the water or sediments has been undertaken.

The 60 square mile (38,400 acre) watershed receives 48 inches of rainfall annually and contributes approximately 80,000 acre-feet (71.4 million gallons per day, MGD) of freshwater inflow to Clear Lake. This rainfall varies greatly, even between localities very close together, and episodes of exceptionally heavy precipitation occur. Most of the watershed lies within the city limits of Pasadena, Deer Park, La Porte and Houston and has 38 percent residential-urban and 6 percent industrial land use. Point source discharges have declined in number, from 6 to 3, but the volume of wastewater discharged has increased 35 percent, to 6.2 MGD, over the past decade. Point source stormwater discharges were 1.8 MGD in 1989.

Controversial issues in recent years have involved the accelerated and increased delivery of residential-area stormwater to the bayou and the removal of irrigation water from the bayou. The current water quality monitoring station at Bay Area Boulevard does not reflect the

input of nutrients and pollutants from Horsepen Bayou, a major tributary which receives the bulk of treated wastewater effluent discharged into the bayou. The quarterly or semi-annual monitoring of recent years is inadequate to determine stream conditions. A 24-hour water quality survey during the warm season is needed to determine the extent of oxygen sag during hours of darkness. An additional monitoring station that will reflect the contribution of pollutants from Horsepen Bayou is needed. Monthly sampling should be resumed for 2 to 3 years to establish an adequate baseline of information. An investigation of toxicants in water and sediment samples should be conducted.

The flora and fauna of Armand Bayou are poorly known and population trends cannot be determined. The freshwater biota upstream of Bay Area Boulevard, and in the tributaries, is virtually unknown. The lower reach is potentially a valuable nursery habitat for certain commercial and recreational finfishes and shellfishes. A survey of these species in Mud Lake should be undertaken. The extent of bottomland forest flooding and value of this forest habitat as a contributor of detritus and nutrients, and as a sink for nutrients and pollutants, should be determined.